

REMARKS

Applicants believe that, other than the filing fee required for filing the RCE and the fee for request for extension of time for three months filed herewith, no additional fee is due with this response. However, if any additional fee is due, please charge our Deposit Account No. 50-0591, under Order No. 17133/002002 from which the undersigned is authorized to draw. Please reconsider the application in view of the above amendments and the following remarks.

Applicants thank the Examiner for carefully considering this application.

Applicants previously amended Claim 31 to set forth a definite temperature at or below which the process is completed to make the carbon alloy product claimed therein. All pending claims that have not been withdrawn from consideration depend from claim 31 or from one or more intermediate claims that depend from claim 31. Applicants traverse the rejection of claims 31-72 as anticipated, 102 (b) by or in the alternative obvious, 103(a), over Zondlo et al. 5955375, because the product being produced, in Zondlo et al., (i.e., carbon products converted to graphite at high temperatures), is not the product produced by Applicants' invention, (i.e., a molded carbon alloy). Because the process steps of Applicants do not include heating to above the graphitization temperature as in Zondlo, a different product results. Even if the starting carbon has a small component or a minor domain of graphite, (and if it does that component of domain is incidental at most) the product produced by Applicants' invention is not newly produced graphite, it is a newly produced carbon alloy. It is respectfully submitted that product produced by Zondlo et al. is graphite and/or it contains primarily or at least a dominant portion as graphite, so that the product claimed to be produced by Applicants' process is clearly different from the one by Zondlo et al. The assertion that no differences are seen by the Examiner is not understood. The graphite nature of the Zondlo et al. product should be seen and understood from the Zondlo et al. patent. The claimed product produced by the process by Applicants is a carbon alloy product, graphite is not the product produced by Applicants' process. A carbon alloy product is different from the Zondlo et al. graphite product.

Applicants respectfully assert that a "carbon alloy" is a unique formation of carbon that has more than one type of carbon bonding. The carbon bonding in graphite materials as in Zondlo et al. is only one kind of carbon bonding, namely, sp^3 . It is respectfully submitted

that scientific literature indicates that the uniform single form of bonding in graphite is different from carbon alloys. In carbon alloys "...carbons with different hybrid orbitals account as different components." (See, *CARBON ALLOYS, Novel Concept to Develop Carbon Science and Technology*, Yasuda et al., at page 9 (2003), [IDS REF. B9]. This means that carbon alloys have combination carbons with different hybrid orbital, for example (sp and sp³), (sp and sp³), (sp² and sp³), or (sp and sp² and sp³). Normally, a given carbonaceous material will have bonds formed by only one or another of the various kinds of hybrid orbitals. Thus, Applicants respectfully disagree and hereby traverse the Examiner's assertion that there is no difference in Applicants' product, one with a plurality of different hybrid orbital carbon bonding, and the graphite product of Zondolo et al. that is formed with only one particular type of carbon bonding. According to Applicants' claim 31, the claimed product is characterized as "a molded carbon alloy" and according to the limited scientific literature currently available in this field, a "carbon alloy" has a plurality of different hybrid orbital bonding components (for example this definition would apply to combinations of carbon bonding such as: sp and sp², sp and sp³, sp² and sp³, or sp, sp², and sp³). It is also well recognized in the scientific literature that graphite has a single kind of hybrid orbital (sp³) that can be created in a process only from application of extreme high heat conditions.

Moreover, Applicants' Claim 31 calls for a temperature at or below which the process of producing the claimed product takes place and the temperature of this process is below the temperature at which graphite is produced. This defines the claimed product as something other than graphite. The claimed product produced by Applicants' process is not graphite. Thus, it is not the same as the product produced by Zondlo et al. The Examiner asserts that because the lower temperature of Applicants' process does not eliminate previously existing graphite in the feed material, the temperature of the claimed process does not preclude graphite as a product. However, this misses the point of defining a product by a process that produces the product. The product produced by Zondlo et al. is graphite, the product produced by Applicants is a carbon alloy. Below the maximum temperature claimed, 1300°C, no significant graphite is newly produced, thus only a carbon alloy (carbon material having a plurality of kinds of hybrid carbon bonds) is produced. The product produced by the claimed process is not graphite. The Applicants' process for making the claimed product is only at temperatures up to temperatures at which there is no sufficient graphite formation so that the graphite product of Zondlo et al

process would not result. The assertion in the Office Action that no differences are seen in the product is respectfully overcome by this showing by Applicants that the products produced by the processes are different, in the cited reference the process produces a graphitized product and in Applicants' claim 31 the process produces a molded carbon alloy product (no graphite is produced by the process.) There is a distinct difference between graphite products produced by Zondlo et al. at a high temperature and Applicants' carbon alloy products. Graphite is a carbon form that has a parallel stacked plate structure, which structure is slidable between plates to form an oil like structure often used as a lubricant because of this oil like slidable plate structure. In contrast, the molded carbon alloy products produced by Applicants at a low temperature, relative to the minimum graphite formation temperatures, is a unique carbon form that has a plurality of different bonding modes known as a plurality of hybrid orbital carbon bonds, and without the singleness of graphite bonds, the carbon alloy is not going to have the homogeneous parallel plate structure that permits the slidable plates, oil like structure that is characteristic of graphite. Stated another way, Applicants' process produces a molded carbon alloy product that is a carbon product with different hybrid orbital bonding that accounts as different components. Applicants' claimed product is different from Zondlo et al. The Zondlo et al. process does not result in the molded carbon alloy as claimed by Applicants, and Applicants' claimed invention is not anticipated by Zondlo et al.

In view of the purpose for graphitization to obtain a graphite product in Zondlo et al., there is no showing in the Office Action that the product claimed by Applicants would be obvious in view of Zondlo et al. Those skilled in the art would not find it obvious to modify the process of Zondlo et al., such as by using lower temperatures to produce a different product, namely a product without sufficient graphitization for the purposes of Zondlo et al. The differences in the Zondlo et al. product, the differences in the process, and the differences in the motivation clearly indicate that Applicants' invention is not obvious in view of Zondlo et al.

For at least one or more of the foregoing reasons the rejection of claims 31-72 (as amended) as anticipated by or in the alternative obvious over Zondlo et al. 595375 has been traversed. Reconsideration and withdrawal of the rejections are respectfully requested.

Applicants respectfully traverse the rejection of claims 31-72 as anticipated by or in the alternative obvious over Ubbelohde 4213956 (Ubbelohde). Applicants have amended

claim 31 to set forth a definite temperature at or below which the process is completed to make the carbon alloy product claimed therein. All pending claims 32-72 that have not been withdrawn from consideration depend from claim 31 or from one or more intermediate claims that depend from claim 31. Applicants respectfully traverse the rejection of claims 31-72 as anticipated, 102(b) by or in the alternative obvious, 103(a), over Ubbelohde. Applicants traverse the assertion in the Office Action that although the process of Ubbelohde is not shown to be the same, no differences are seen in the product of Ubbelohde and the product of Applicants' claims. It is respectfully submitted that the Ubbelohde process produces a graphitized product. The production of a graphite product should be seen and understood by those of ordinary skill in the art from the Ubbelohde patent. In contrast, Applicants' claimed product is one produced by a process that is below the temperature at which graphite could be produced. The resulting product is a molded carbon alloy product, not graphite, and this is different from the product produced by Ubbelohde. The process steps disclosed by Ubbelohde are clearly different from those disclosed and claimed by Applicants; at least because all of Applicants' steps occur at temperatures below the graphite formation temperature and there is not doubt that graphite is formed by Ubbelohde. The temperature for forming graphite is known to be above the lower end of the range of temperatures disclosed by Ubbelohde. It is clear that since graphite is to be formed by Ubbelohde, the graphite formation must be accomplished at a temperature above the temperature claimed for the process that defines Applicants' product.

Ubbelohde does not disclose all the steps of Applicants' invention. Ubbelohde produces a graphitized carbon. Applicants claim a product produced by a process that uniquely produces a molded carbon alloy, a product that is formed entirely below the temperature at which graphite would be formed, such that the resulting product is clearly different. Ubbelohde does not anticipate Applicants' claimed product by process.

There is no showing that the product of Applicants would be obvious in view of the differences in the Ubbelohde product and the differences in the Ubbelohde process. In view of Ubbelohde, those skilled in the art would not find it obvious to use temperatures below graphitization temperatures to produce a carbon alloy product, when the object of Ubbelohde is to produce a graphite product. There is no suggestion in Ubbelohde to produce any other product that does not result from graphitization. The differences in the Ubbelohde product, the differences in the process, and the differences in the motivation clearly indicate that Applicants'

invention is not obvious in view of Ubbelohde. Reconsideration and withdrawal of the rejection are respectfully requested.

Applicants respectfully traverse the rejection of claims 31-72 as anticipated by or in the alternative obvious over Morgan 3867499 (Morgan). Applicants have previously amended claim 31 to set forth a definite temperature at or below which the process is completed to make the carbon alloy product claimed therein. All pending claims that have not been withdrawn from consideration depend from claim 31 or from one or more intermediate claims that depend from claim 31. Applicant respectfully traverses the rejection of claims 31-72 as anticipated, 102(b) by or in the alternative obvious, 103(a), over Morgan. Applicants traverse the assertion in the Office Action that although the process of Morgan is not shown to be the same, no differences are seen in the product of Morgan and the product of Applicants claims. It is respectfully submitted that the Morgan product is a graphitized product. The graphite nature of the Morgan product should be seen and understood from the Morgan patent by those of ordinary skill in the art. All the process steps have not been shown to be disclosed by Morgan. The claimed product is a unique molded carbon alloy product, not graphite, and this is different from the Morgan product.

Moreover, Applicants' claim 31 has previously been amended to more clearly claim the invention in terms of a temperature at or below which the process takes place. This amendment is supported in the specification. No new matter is added and no new search should be required. This amendment also avoids ambiguity of the term melting point of carbon, and whether that is the point at which carbon begins "melting" locally by introducing stacking faults in the bonding structure or where carbon begins to transition to a *turbostatic* condition, or the temperature at which all of the carbon becomes fluid. A sufficient amount of graphite for the purposes of Morgan's product must be created at high temperatures indicated to be "above about 1,800°C." and by heating to "1,800 °C – 3,000°C. The Applicants' process for making the claimed molded carbon alloy product is entirely at temperatures at which there is no significant graphite formation and the graphite product of Morgan is not formed by Applicants' process. The assertion in the Office Action that "no differences are seen" is deemed to be unsupported and in any event is respectfully overcome by this showing by Applicants that the products are different. The Morgan product is graphitized carbon. Applicants' product is one formed below the temperature at which sufficient graphite forms, such that the resulting product is clearly

different from the Morgan product. Carbon alloys have combination carbons with different hybrid orbital carbon bonds (sp and sp^2), (sp and sp^3), (sp^2 and sp^3), or (sp and sp^2 and sp^3). Normally, a given carbonaceous material will have only one or the other of the various kinds of hybrid orbital carbon bonds. Graphite has only one type of hybrid orbital bonding. Thus, Applicants respectfully disagree and traverse the Examiner's assertion that there is no difference in Applicants' product with a plurality of different hybrid orbital carbon bonding contrasted to graphite produced by Morgan. Graphite is formed with only one particular type of carbon bonding. There is also no showing that the product of Applicants would be obvious in view of the differences in the Morgan product and differences in the Morgan process. For at least one or more of the foregoing reasons, Applicants respectfully traverse the rejection of claims 31-72 as anticipated by or in the alternative obvious over Morgan 3867499. Reconsideration and withdrawal of the rejections are respectfully requested.

The Examiner has also rejected claims 31-72 under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Tither et al. article. The Tither et al. article discloses an investigation of very thin film carbon formed by carbon evaporation and carbon film deposition. In the processes described, carbon is deposited in a very thin file (one thin layer) on a metal support or substrate such as on an aluminum plate. The primary bonding indicated in the film of Tither et al. is graphitic bonding (graphite), and the assertion that there may be other possible forms of bonding in the deposited thin film is apparently unintended, because the purpose of the investigation seems to be finding better ways to make a pure layer of deposited carbon film. Moreover, in contrast to the thin carbon film deposited on another substrate such as aluminum, Applicants' claim a molded product, not a film, not a product produced by film deposition, and is instead a molded carbon alloy product that has its own structural integrity (not relying on an aluminum substrate for support as in the case of the Tither et al. film deposit). Applicants' molded carbon alloy product defined by the process as claimed is different in many ways as indicated above and is not anticipated by Tither et al.

Nothing in Tither et al. suggests or makes obvious the molded carbon alloy product produced by the process as claimed by Applicants. There is no teaching in the art cited to suggest any modification of Tither et al. that would result in the molded carbon alloy product as claimed by Applicants. It is respectfully submitted that there is no molding in Tither et al.

and as such, a molded carbon alloy cannot be said to be made by any of the carbon film deposition processes discussed in the Tither et al. article and an article investigating film deposition would not make it obvious to produce a molded carbon alloy product.

In the Office Action the Examiner invites Applicants to indicate why the carbon alloy indicated the reference book titled *Carbon Alloy* does not read on Applicants' claimed product. It should be noted that the book, *CARBON ALLOYS, Novel Concept to Develop Carbon Science and Technology*, Yasuda et al., at page 9 (2003), [IDS REF. B9], was published in 2003 and the present application has a priority date of 2000. Such that the book is not considered to be prior art, and it was made of record to demonstrate that the term "carbon alloy" as used in the present application has the meaning ascribed to it by Applicants and that the claims will have such a meaning to the public. The book indicates that the term was coined before the present application was filed, possibly in 1992. Moreover, the coining of the term "carbon alloy" including a definition thereof was for products or materials that some scientist, including some of the authors of the book titled *Carbon Alloy*, thought should be investigated. However, there is no showing that the specific molded carbon alloy product as claimed by Applicants was made prior to Applicants' invention of such a product as defined by the process for making it disclosed and claimed by Applicants. There is no prior teaching in any of the references cited that would show how such a product could be made.

Applicant believes this reply is fully responsive to all outstanding issues and places this application in condition for allowance. If this belief is incorrect, or other issues arise, the Examiner is encouraged to contact the undersigned or his associates at the telephone number listed below. Please apply any charges not covered, or any credits, to Deposit Account 50-0591 (Reference Number 17133/002002).

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Respectfully submitted,

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